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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,380	12/12/2003	Henry S. Eilts	TI-35513	1690

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EXAMINER	
VUONG, QUOCHIEN B	
ART UNIT	PAPER NUMBER
2618	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/735,380	EILTS ET AL.	
	Examiner	Art Unit	
	Quochien B. Vuong	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14,20 and 21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14, 20, and 21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This action is in response to applicant's response filed on 01/09/2007. Claims 1-14 and 20-21 are now pending in the present application. This action is made non-final.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 10-14 and 20-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is noted that claims 10 and 20 recites both an apparatus and method steps of using the apparatus, thus, claims 10-14 and 20-21 are indefinite and ambiguous because claims 10-14 and 20-21 are directed to neither a "process" nor a "machine", but rather embraces or overlaps two different statutory classes of invention. Further it is not clear what included and not included in the system of claims 10 and 20.

For the purpose of examining, the Examiner is given claims 20-21 a broadest reasonable interpretation.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-8, 10-14 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vaidanathan et al. (US 7,031,669) in view of Baldwin et al. (US 6,735,422).

Regarding claim 1, Vaidyanathan et al. disclose a method for calibrating a MIMO-based system (i.e., see Figs. 1, 4 and 5; col. 3, lines 10+), the process comprising: transmitting a calibration signal (i.e., noted the transmission a calibration signal from the first transmitter 120/110 as shown in Figs. 1, 4 and 5; see col. 4, lines 1-40, col. 5, lines 25+, col. 7, lines 20+, col. 9, lines 5+ and col. 11, lines 30+); receiving the calibration signal (i.e., noted the receiving a calibration signal from the first transmitter 120/110(1) at the receiver 135/110(2) as shown in Figs. 1, 4 and 5; see col. 4, lines 1-40, col. 5, lines 25+, col. 7, lines 20+, col. 9, lines 5+ and col. 11, lines 30+); decoding the calibration signal to produce a measurement (i.e., as shown in Figs. 4 & 5 and further discussed in Steps 1-7 and Steps 1-5 in columns 9 and 11, the signal received at the receiver 135 is respectively decoded to produce a measurement for performing calibration/correction); storing the measurement (i.e., as shown in Fig. 3, the measurement values are stored in the memory 165; see col. 7, lines 45, col. 9, lines 64+, col. 10, lines 25+, and col. 12, lines 12+). Vaidyanathan et al. do not specifically disclose calibrating an AGC comprising the steps of transmitting an AGC calibration signal, receiving and decoding the calibrating signal to produce a measurement, storing the measurement, changing an AGC gain setting and repeating the transmitting,

receiving, decoding, storing, and changing operations to determine an optimal AGC gain setting. However, Baldwin et al. disclose calibrating an AGC comprising the steps of transmitting an AGC calibration signal, receiving and decoding the calibrating signal to produce a measurement, storing the measurement, changing an AGC gain setting and repeating the transmitting, receiving, decoding, storing, and changing operations to determine an optimal AGC gain setting (column 21, line 11 – column 22, line 55; and column 24, lines 22-47). Therfore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to adapt the calibrating AGC of Baldwin et al. to the method of Vaidyanathan et al. in order to properly adjust the gain and keep the input signal at a target power level.

Regarding claim 2, Vaidyanathan et al. disclose wherein the transmitting, receiving, decoding, storing, and changing operations are performed by a single multiple-input-multiple-output (MIMO) wireless device (i.e., Fig. 4 and col. 8, lines 40+).

Regarding claim 3, Baldwin et al. disclose wherein the transmitting, receiving, decoding, storing, and changing operations are performed for each AGC gain setting (column 21, line 11 – column 22, line 55; and column 24, lines 22-47).

Regarding claim 4, Vaidyanathan et al. disclose wherein transmitting a calibration signal comprises transmitting a single frequency centered on a fast Fourier transformer bin (i.e., noted the use of FFT shown in Fig. 5 of the OFDM system; and noted the use of single frequency centered on a FFT for an OFDM scheme as shown in Fig. 5; see col. 14, lines 5+).

Regarding claim 5, Vaidyanathan et al. disclose further comprising generating a calibration signal by applying a non-zero coefficient to an inverse fast Fourier transformer (i.e., noted the non-zero coefficient C(k) applied to the multipliers 197 before the IFFT as shown in the OFDM system of Fig. 5).

Regarding claim 6, Vaidyanathan et al. disclose wherein decoding the calibration signal comprises using a fast Fourier transformer (i.e., noted the use of FFT shown in Fig. 5 of the OFDM system).

Regarding claim 7, Vaidyanathan et al. disclose further comprising accessing the measurement to improve AGC performance (i.e., noted the improvement of the ACG performance as discussed in col. 5, lines 15+ and col. 7, lines 20-68).

Regarding claim 8, Vaidyanathan et al. disclose further comprising normalizing the measurement (i.e., as discussed in col. 4, lines 20+ that the normalizing the measurement for obtaining power to unity).

Regarding claim 10, Vaidyanathan et al. disclose a MIMO-based system (i.e., see Figs. 1, 4 and 5; col. 3, lines 10+) comprising an AGC, and a calibrating iterative process comprising: transmitting a calibration signal (i.e., noted the transmission a calibration signal from the first transmitter 120/110 as shown in Figs. 1, 4 and 5; see col. 4, lines 1-40, col. 5, lines 25+, col. 7, lines 20~-, col. 9, lines 5+ and col. 11, lines 30+); receiving the calibration signal (i.e., noted the receiving a calibration signal from the first transmitter 120/110(1) at the receiver 135/110(2) as shown in Figs. 1, 4 and 5; see col. 4, lines 1-40, col. 5, lines 25+, col. 7, lines 20+, col. 9, lines 5+ and col. 11, lines 30+); decoding the calibration signal to produce measurements (i.e., as shown in Figs. 4 & 5

and further discussed in Steps 1-7 and Steps 1-5 in columns 9 and 11, the signal received at the receiver 135 is respectively decoded to produce a measurement for performing calibration/correction); storing the measurements (i.e., as shown in Fig. 3, the measurement values are stored inthe memory 165; see col. 7, lines 45, col. 9, lines 64+, col. 10, lines 25+, and col. 12, lines 12+). Vaidyanathan et al. do not specifically disclose calibrating an AGC comprising the steps repeating the transmitting, receiving, decoding, storing, and changing an AGC gain setting. However, Baldwin et al. disclose calibrating an AGC comprising the steps of repeating the transmitting, receiving, decoding, storing, and changing an AGC gain setting (column 21, line 11 – column 22, line 55; and column 24, lines 22-47). Therfore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to adapt the calibrating AGC of Baldwin et al. to the system of Vaidyanathan et al. in order to properly adjust the gain and keep the input signal at a target power level.

Regarding claim 11, Baldwin et al. discloses wherein the iterative process is repeated for each AGC gain setting (column 21, line 11 – column 22, line 55; and column 24, lines 22-47).

Regarding claim 12, Baldwin et al. disclose wherein the AGC comprises a controller and at least one adjustable gain amplifier (see figures 4-6).

Regarding claim 13, Vaidyanathan et al. disclose wherein the calibration signal comprises a single frequency centered on a fast Fourier transformer bin (i.e., noted the use of single frequency centered on a FFT for an OFDM scheme as shown in Fig. 5; see col. 14, lines 5+).

Regarding claim 14, Vaidyanathan et al. disclose wherein the measurements are used to improve performance of the system (i.e. the calibration/correction as shown in steps 1-7 and 1-5 of Figs. 4 and 5 clearly improve performance of the system).

Regarding claim 20, it is noted that claim 20 corresponds to the claims 1-8 and 10-14 as discussed above, thus, claim 20 is rejected for the same reasons as discussed for claims 1-8 and 10-14 above.

Regarding claim 21, Baldwin et al. disclose wherein the AGC comprises a controller and at least one adjustable gain amplifier (see figures 4-6).

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vaidanathan et al. in view of Baldwin et al. and further in view of Tellado et al. (U.S. 2004/0198276 A1).

Regarding claim 9, it is noted that although Vaidyanathan et al. and Baldwin et al. do not explicitly show prepending a cyclic prefix to the calibration signal.

However, Tellado et al. teach that it's conventionally known in the OFDM system that data is transmitted in bursts, and each burst consists of a cyclic prefix followed by data symbols and/or data symbols followed by a cyclic suffix, and Tellado et al. further teache prepending a cyclic prefix to the calibration signal is known to one having ordinary skilled in the art at the time of the invention was made (i.e., see paragraphs 0066-0072).

In view of the above, having the system of Vaidyanathan et al. and Baldwin et al. and then given the well-established teaching of Tellado et al., it would have been

obvious to one having ordinary skill in the art at the time of the invention was made to modify the system of Vaidyanathan et al. and Baldwin et al. as taught by Tellado et al., since Tellado et al. state in paragraphs 0018 such a modification would minimize the effects of noise and distortion in the receiver.

Response to Arguments

5. Applicant's arguments with respect to claims 1-14 and 20-21 have been considered but are moot in view of the new ground(s) of rejection.

6. Applicant's arguments filed 01/09/2007 regarding the 112, 2nd paragraph rejection of claims 20 and 21 have been fully considered but they are not persuasive since they are overlaps two different statutory classes of invention because the steps of iterative process are part of the claims.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quochien B. Vuong whose telephone number is (571) 272-7902. The examiner can normally be reached on M-F 9:30-18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Quochien B. Vuong
Mar. 16, 2007.

QUOCHIEN B. VUONG
PRIMARY EXAMINER